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Cochran et al.

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(54) **HEADSET WITH MAJOR AND MINOR ADJUSTMENTS**

(71) Applicant: **Voyetra Turtle Beach, Inc.**, Valhalla, NY (US)

(72) Inventors: **Scot Robert Cochran**, San Diego, CA (US); **Tim Wiley**, San Diego, CA (US); **Andy Logan**, Newbury Park, CA (US)

(73) Assignee: **Voyetra Turtle Beach, Inc.**, Valhalla, NY (US)

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H04R 5/033 (2006.01)

(52) **U.S. Cl.**
CPC ***H04R 1/1091*** (2013.01); ***H04R 1/1066*** (2013.01); *H04R 1/1008* (2013.01); *H04R 5/0335* (2013.01); *H04R 2201/107* (2013.01)

(58) **Field of Classification Search**
CPC .. H04R 5/0335; H04R 1/1066; H04R 1/1008; H04R 1/105; H04R 5/033; H04R 1/1016; H04R 1/1058; H04R 2201/107; H04R 1/10; H04R 2201/109
See application file for complete search history.

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Primary Examiner — Matthew A Eason
Assistant Examiner — Taunya McCarty
(74) *Attorney, Agent, or Firm* — McAndrws, Held & Malloy

(57) **ABSTRACT**

A method and system for a headset with major and minor adjustments, where the headset comprises a headband, a headband endcap at each end of the headband, a headband slide coupled to each headband endcap, ear cups operatively coupled to the headband slides, and a floating headband coupled to the headband endcaps. A major adjustment of the headset may include actuating a headband slide in a vertical direction. The ear cups may be operatively coupled to the headband slides utilizing ball detents that may hold the position of the ear cups with respect to the headband slides. The ball detents may comprise a portion of a ball on the

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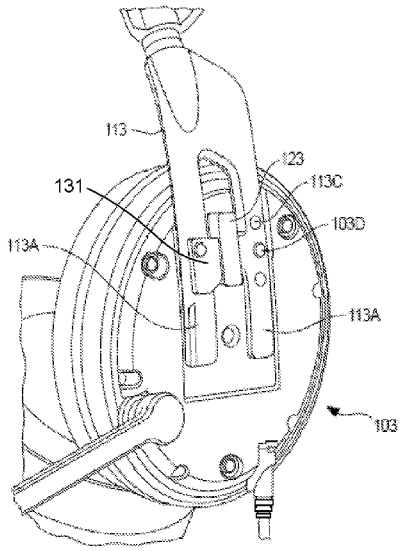

headband slide and holes in the ear cup or may comprise a portion of a ball in the ear cup and holes in the headband slide. Each headband slide may be coupled to a headband endcap via a headband pivot.

20 Claims, 6 Drawing Sheets

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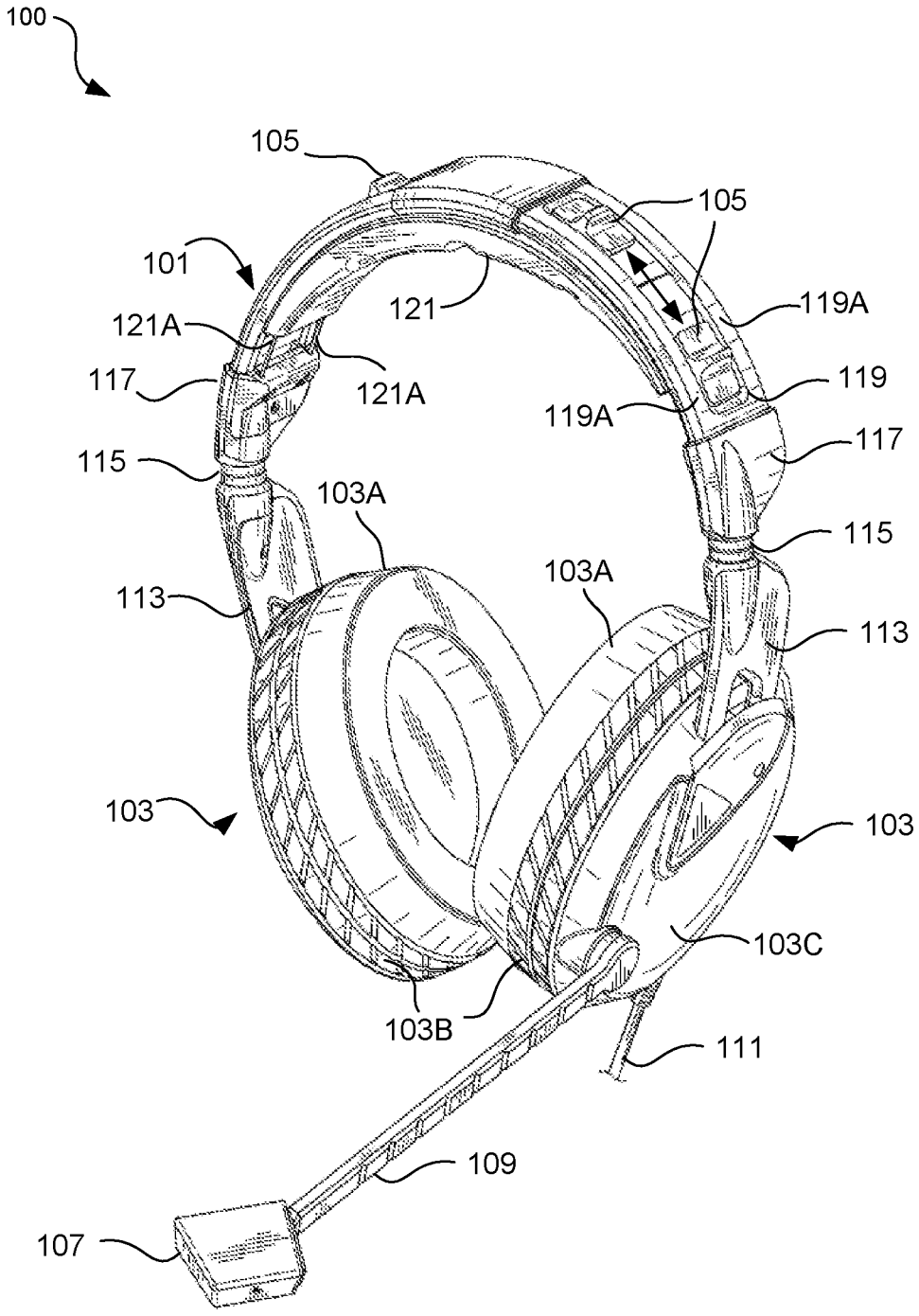

100
105
105
101
121
119A
121A
121A
117
119
119A
117
115
103A
115
103A
113
113
103
103
103C
103B
111
109
107

FIG. 1

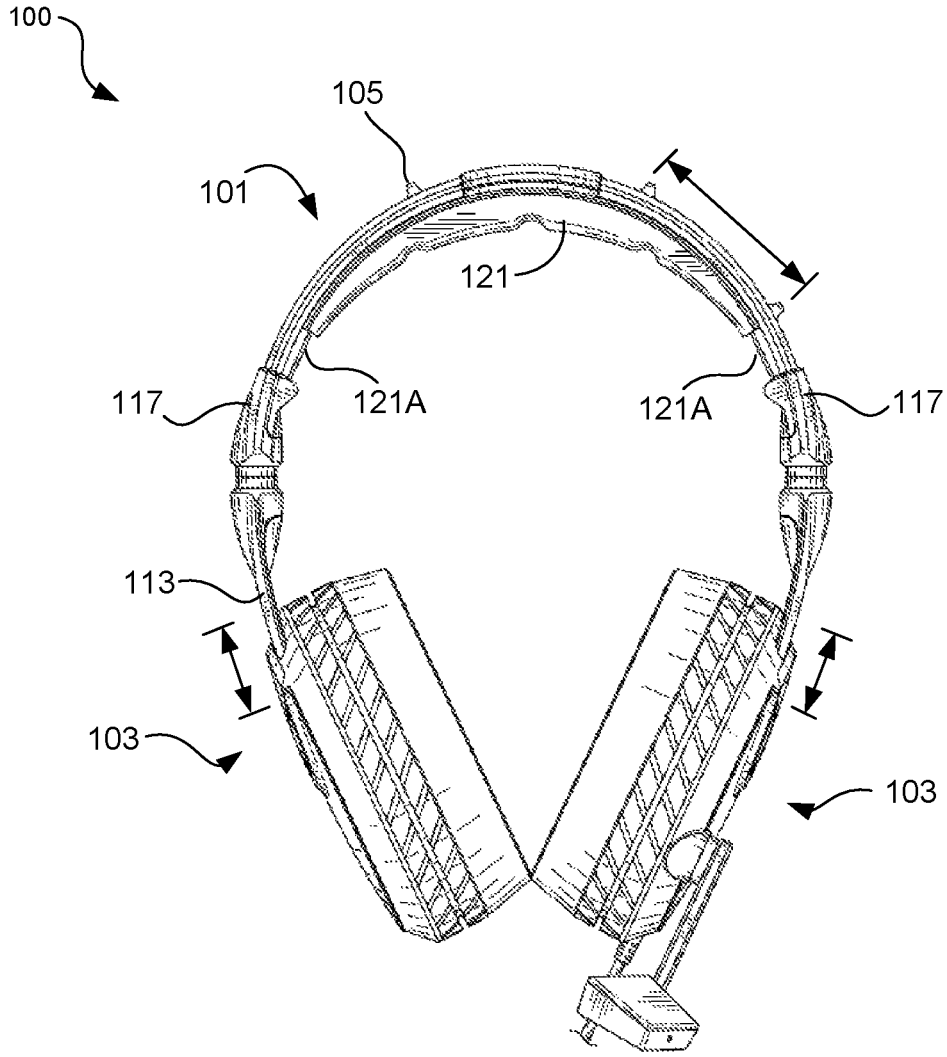


FIG. 2

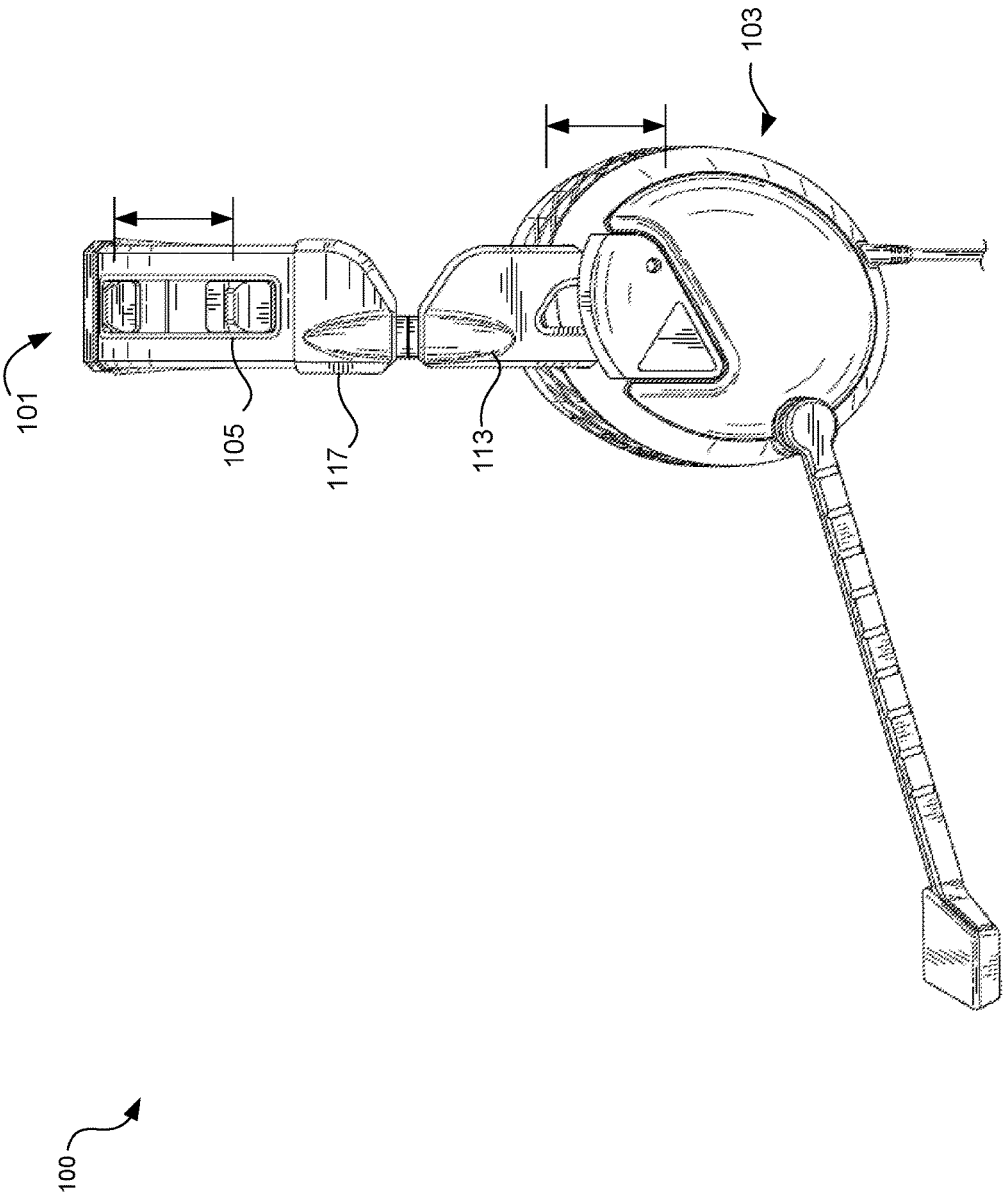


FIG. 3

FIG. 4B

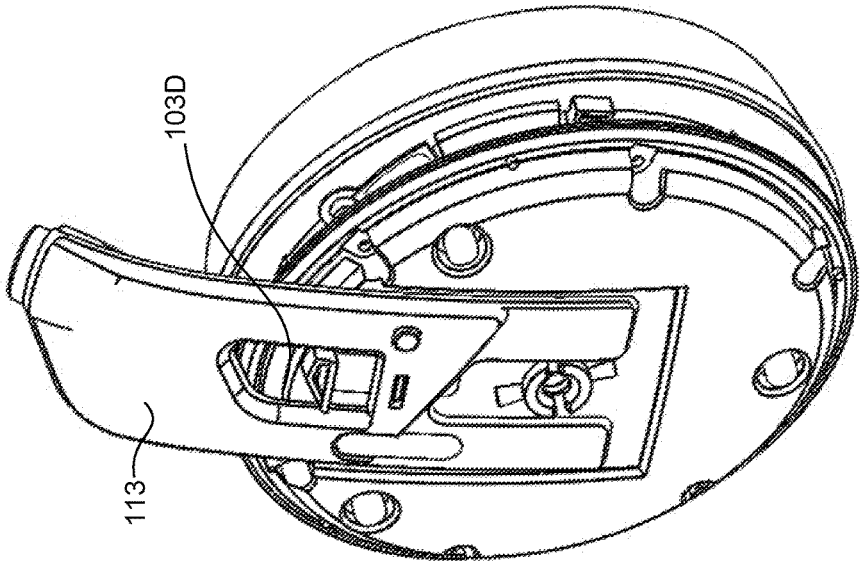
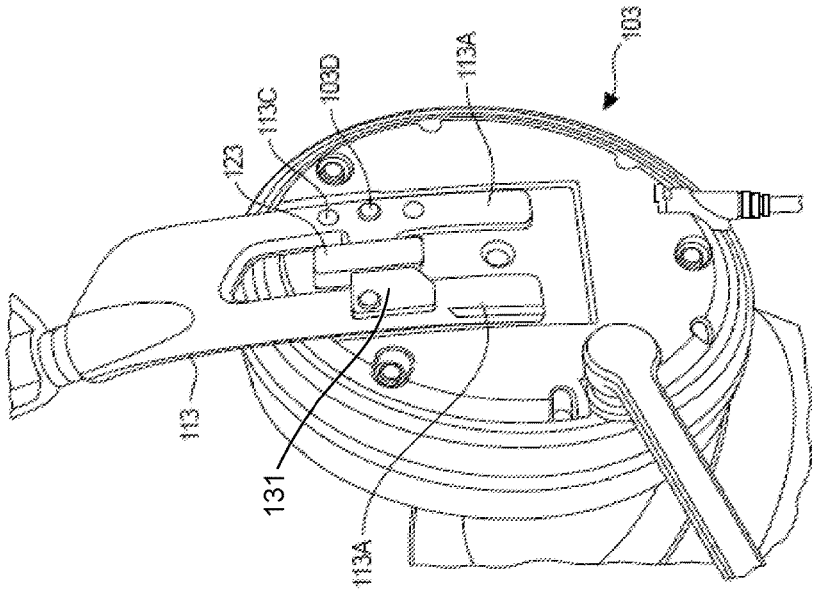


FIG. 4A



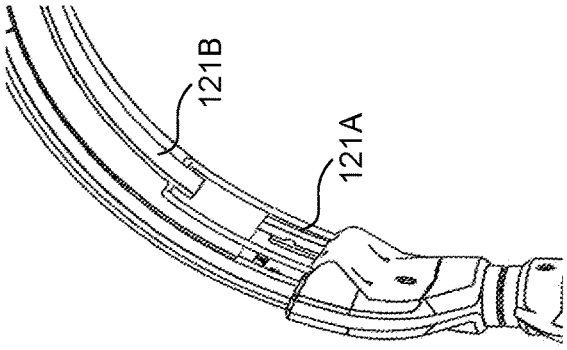


FIG. 5B

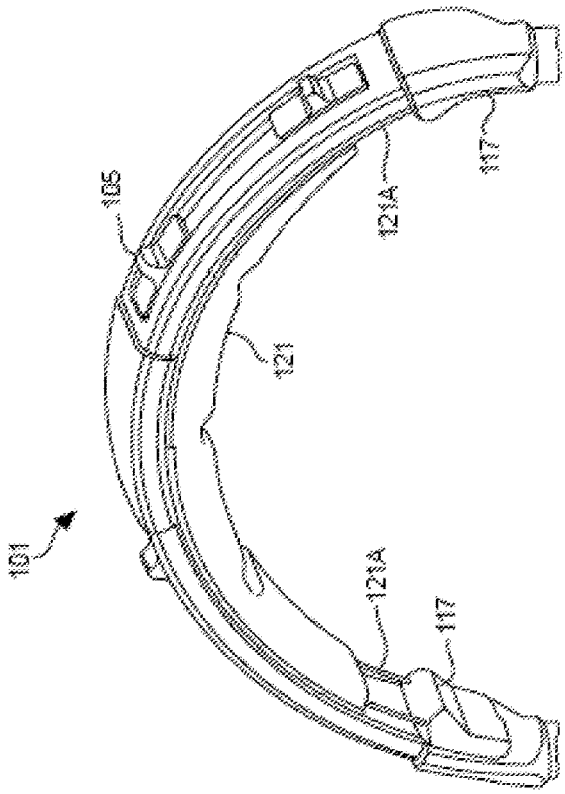


FIG. 5A

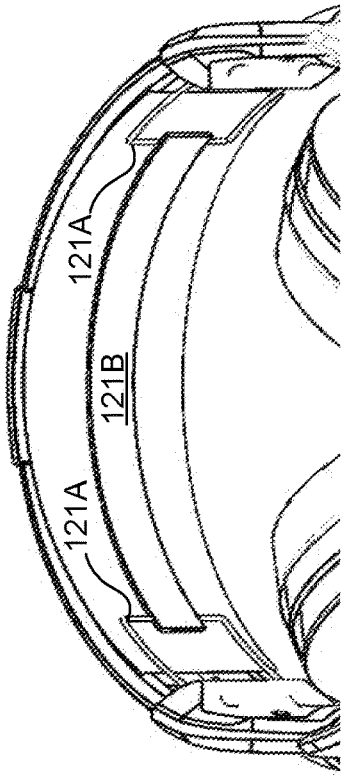


FIG. 5C

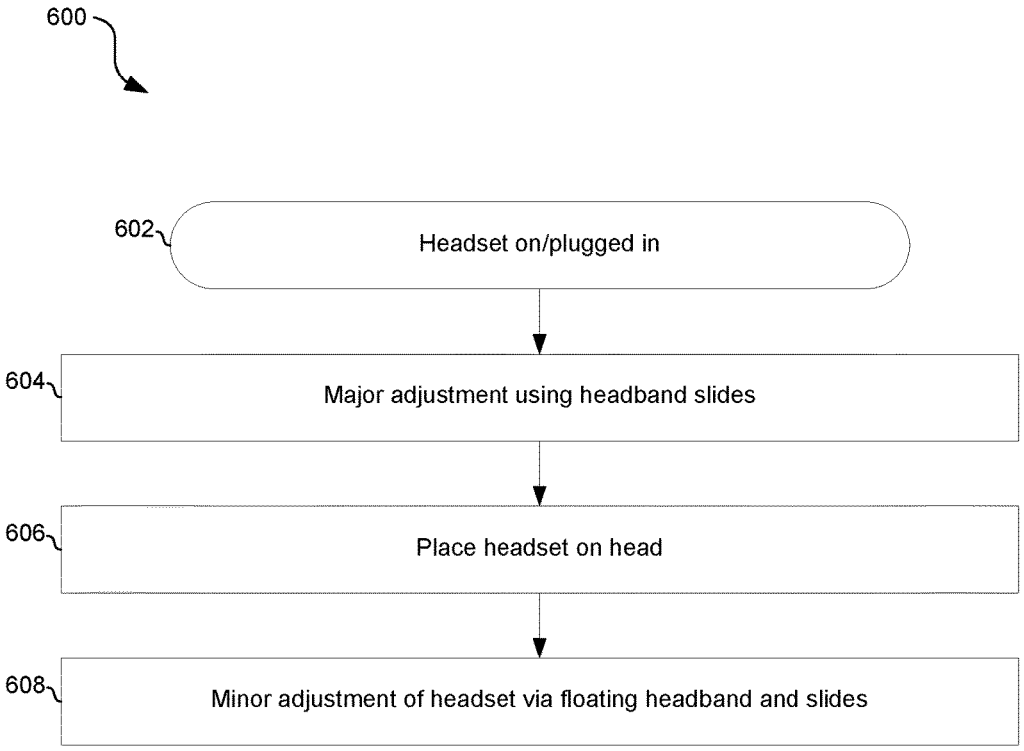

600
602
Headset on/plugged in
604
Major adjustment using headband slides
606
Place headset on head
608
Minor adjustment of headset via floating headband and slides

FIG. 6

HEADSET WITH MAJOR AND MINOR ADJUSTMENTS

CLAIM OF PRIORITY

N/A

INCORPORATION BY REFERENCE

N/A

TECHNICAL FIELD

Aspects of the present application relate to audio headsets, and more specifically, to methods and systems for a headset with major and minor adjustments.

BACKGROUND

Limitations and disadvantages of conventional approaches to adjustable headsets will become apparent to one of skill in the art, through comparison of such approaches with some aspects of the present method and system set forth in the remainder of this disclosure with reference to the drawings.

BRIEF SUMMARY

Methods and systems are provided for a headset with major and minor adjustments, substantially as illustrated by and/or described in connection with at least one of the figures, as set forth more completely in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** depicts an oblique view of an example headset, in accordance with an embodiment of the disclosure.

FIG. **2** illustrates a front view of a headset with major and minor adjustments, in accordance with an example embodiment of the disclosure.

FIG. **3** is a side view of a headset with major and minor adjustments, in accordance with an example embodiment of the disclosure.

FIGS. **4**A and **4**B illustrate close-up views of an ear cup and headband slide for a headset major adjustment, in accordance with an example embodiment of the disclosure.

FIGS. **5**A-**5**C illustrate close up views of the headband providing headset minor adjustment, in accordance with an example embodiment of the disclosure.

FIG. **6** is a flowchart illustrating an example process for headset major and minor adjustment.

DETAILED DESCRIPTION

Certain aspects of the disclosure may be found in a headset with major and minor adjustments. Example aspects of the disclosure may include, in a headset comprising a headband, a headband endcap at each end of the headband, a headband slide coupled to each headband endcap, ear cups operatively coupled to the headband slides, and a floating headband coupled to the headband endcaps: configuring a major adjustment of the headset by actuating at least one headband slide in a vertical direction. The ear cups may be operatively coupled to the headband slides utilizing ball detents. The ball detents hold the position of the ear cups with respect to the headband slides. The ball detents may comprise a portion of a ball on the headband slide and holes in the ear cup or may comprise a portion of a ball in the ear cup and holes in the headband slide. Each headband slide may be coupled to a headband endcap via a headband pivot. The headband pivot may provide rotational motion of the ear cups with respect to the headband. The floating headband may provide a minor adjustment of the headset. The floating headband may comprise a flexible band with wire segments that extend from the headband endcaps into the floating headband and back down to the headband endcaps.

As utilized herein, "and/or" means any one or more of the items in the list joined by "and/or". As an example, "x and/or y" means any element of the three-element set {(x), (y), (x, y)}. In other words, "x and/or y" means "one or both of x and y". As another example, "x, y, and/or z" means any element of the seven-element set { (x), (y), (z), (x, y), (x, z), (y, z), (x, y, z)}. In other words, "x, y and/or z" means "one or more of x, y and z". As utilized herein, the term "exemplary" means serving as a non-limiting example, instance, or illustration. As utilized herein, the terms "e.g.," and "for example" set off lists of one or more non-limiting examples, instances, or illustrations.

FIG. **1** depicts an oblique view of an example headset, in accordance with an embodiment of the disclosure. Referring to FIG. **1**, there is shown a headset **100** with headband **101** and ear cups **103**. There are also shown a microphone **107**, a microphone boom arm **109**, a line-in cable **111**, headband slides **113**, headband pivots **115**, headband endcaps **117**, an upper headband **119**, and a floating headband **121**. The headset **100** may be utilized for gaming, phone, or audio playback purposes, for example. In an example scenario, the headset **100** comprises a powered headset. In another example scenario, the headset **100** comprises a passive headset.

The headband pivots **115** couple the headband slides **113** to the headband endcaps **117**, and provide rotational control for the ear cups **103**. The ear cups **103** may comprise ear pads **103**A, a gimbal gasket **103**B, and outer shell **103**C.

The microphone **107** provides electrical signals proportional to sound waves detected and may comprise a directional microphone for picking up audio signals from the user while sensing reduced background noise or sound from other sources, for example. The boom arm **109** provides a rigid support for the microphone **107**, enabling an optimal position in front of the user for sensing sound from the user.

The upper headband **119** may be coupled to the headband endcaps **117**, and slider knobs **105** may be incorporated in the upper headband **119** for adjusting the rigidity of the upper headband **119**. In an example scenario, in the region where the slider knobs **105** are integrated, the upper headband comprises two strips **119**A of support structure, e.g., metal or rigid plastic, between which the slider knobs **105** may be actuated. The two slider knobs **105** shown between the strips **119**A on the right side of the upper headband **119** merely indicate the full range of the slider knobs **105** may travel. The slider knobs **105** may be coupled to a metal or rigid plastic strip above the slider knobs **105** in the upper headband **119**. By sliding the slider knobs **105** downward towards the headband endcaps **117**, the rigid strip may increase the rigidity of the upper headband **119**, thereby increasing force of the ear cups **103** against the ears of the user.

The ear cups **103** may be coupled to the headband **101** via headband slides **113** and to headband endcaps **117** via headband pivots **115**. The headband slides may comprise metal or rigid plastic and may comprise a fork structure, where the two tines extend into the ear cups **103** and may have hemispherical ball features thereon that may be slid

into detent features in the ear cup **103**, thereby providing discrete headset size settings that are held in place utilizing a ball detent structure. This vertical adjustment of the headband slides **113** may comprise a major adjustment of the headset **100**. The major adjustment changes the size of the headset **100** as well as the force on the ear.

The force on the ear is adjusted due to the shape and rigidity of the headband **101** and associated parts, such as the headband slides **113**. Extending the length of the arms of the headset by pulling the headband slides out of the ear cups **103** may increase the force on the user's ears, as this decreases the distance between the ear cups **103** when not placed on a head, so that more force is needed to expand the headset **100** over the user's head. In contrast, the force on the ear may be decreased by reducing the length of the arms of the headset by pushing the headband slides **113** into the ear cups **103**.

Minor adjustment of the headset **100** is enabled by the floating headband **121**, which may comprise a flexible band with wire segments **121**A that extend from the headband endcaps **117** into the floating headband **121** and back down to the headband endcaps **117**. The flexibility in the floating headband **121** therefore provides a minor adjustment of the headset **100**.

FIG. **2** illustrates a front view of a headset with major and minor adjustments, in accordance with an example embodiment of the disclosure. Referring to FIG. **2**, there is shown the headset **100** with elements as described with respect to FIG. **1**, for example. The arrow in the upper right shows the range of travel for the slider knob **105**.

The arrows adjacent to the ear cups **103** illustrate the major adjustment of the headset **100**, where the headband slides **113** may be adjusted in and out of the ear cups **103**, thereby the size of the headset **100**. The headband slides **113** may comprise ball features thereon that may temporarily lock into detent features in the ear cups **103** to hold the setting for the major adjustment.

The arrows above the headband **101** indicate the possible motion of the slider knob that may adjust the tension of the headset **100** by configuring the force of the ear cups **103** against the user's head.

In addition, the headband **101** comprises the floating headband **121** that is coupled to the headband endcaps **117** via the wire segments **121**A. The flexibility of the floating headband **121** in concert with the wire coupling provided by the wire segments **121**A enables a minor adjustment of the headset **100**.

FIG. **3** is a side view of a headset with major and minor adjustments, in accordance with an example embodiment of the disclosure. Referring to FIG. **3**, there is shown a side view of the headset **100** with the headband **101** and ear cups **103**. As shown by the arrows by the headband **101** and the ear cup **103**, and as described previously, the headset **100** may be adjusted in various ways. For example, the force on the ear may be adjusted by actuating the slider knob **105**.

The arrows adjacent to the headband **101** indicate the possible motion of the slider knob that may adjust the tension of the headset **100** by configuring the force of the ear cups **103** against the user's head.

A major adjustment of the headset **100** may be enabled by the fork-like structure of the headband slide **113**, which may move vertically into and out of the ear cup **103**. Similarly, the force on the ear is also adjusted due to the shape and rigidity of the headband **101** and associated parts, such as the headband slides **113**. Extending the length of the arms of the headset **100** by pulling the headband slides **113** out of the ear cups **103** may increase the force on the user's ears, as this decreases the distance between the ear cups **103** when not placed on a head, so that more force is needed to expand the headset **100** over the user's head. In contrast, the force on the ear may be decreased by reducing the length of the arms of the headset by pushing the headband slides **113** further into the ear cups **103**.

FIGS. **4**A and **4**B illustrate close-up views of an ear cup and headband slide for a headset major adjustment, in accordance with an example embodiment of the disclosure. Referring to FIG. **4**A, there are shown an ear cup **103** and headband slide **113**, which are as described previously but shown slightly transparent to show details of the headband slide **113** within the ear cup **103**.

As can be seen, the headband slide **113** is also shown as slightly transparent to show ball and detent features in the headband slide and ear cup. There is also shown a guide **123** that may guide the headband slide **113** up and down. The guide **123** may comprise a metal or rigid plastic element for accepting a "cross-bar" element **131** between the two tines **113**A of the headband slide **113**, thereby allowing vertical motion while confining the headband slide **113** in other directions.

The ball detent **103**D comprises a hemispherical shape formed of metal or plastic, for example, in the ear cup **103**, that may be engaged with holes **113**C in the headband slide **113** depending on the position of the headband slide **113** in the ear cup **103**. While only one ear cup **103** is shown in FIGS. **4**A and **4**B, the features shown may also be incorporated in the other ear cup (not shown). In an alternative scenario, the ball detent may instead be in the headband slide **113** and the hole features may be in the ear cup **113**.

FIG. **4**B illustrates another side view of the headband slide **113** and ear cup **103**. As shown in FIG. **4**B, the ball detent **103**D comprises a ball/hole feature formed in the headband slide **113** and the ear cup **103**.

In operation, a user of the headset may pull the headband slides **113** outward from the ear cups **103** to increase the size of the headband **101** or alternatively may push the headband slides **113** further into the ear cups **103** to reduce the size of the headband **101**. The ball detent **103**D may hold the configured position of the ear cup **103** and headband slide **113**. While the size of the headset **100** is configured, changing the position of the headband slides **113** also configures the force on the ear, as extending the ear cups downward places the ear cups **103** closer together.

FIGS. **5**A-**5**C illustrate close up views of the headband providing headset minor adjustment, in accordance with an example embodiment of the disclosure. Referring to FIG. **5**A, there are shown the headband **101**, headband endcaps **117**, floating headband **121**, and wire segments **121**A. There is also shown slider knob **105** and its full range of travel illustrated by the two positions shown.

The headband **101** comprises the floating headband **121** that is coupled to the headband endcaps **117** via the wire segments **121**A. The flexibility of the floating headband **121** in concert with the wire coupling provided by the wire segments **121**A enables a minor adjustment of the headset **100**, as the floating headband **121** flexes with force from the head of the user.

FIG. **5**B illustrates an even closer view of the headband, with the outer surface of the floating headband **121** not shown, for clarity. As shown in FIG. **5**B, the wire segments **121**A may be coupled to an elastic band **121**B, providing the minor headset adjustment due to the flexibility of the elastic band **121**B, which is not visible with the outer surface of the floating headband **121**.

FIG. **5**C illustrates a view of the headband **101** from below, again with the outer surface of the floating headband **121** not shown, so that the wire segments **121**A and elastic band **121**B are fully visible. In use, the user's head may press against the elastic band **121**B, through the outer surface of the floating headband **121**, which may stretch somewhat, thereby providing a minor adjustment of the headset **100**.

FIG. **6** is a flowchart illustrating an example process for headset major and minor adjustment. Referring to FIG. **6**, there is shown a flow chart **600**, comprising a plurality of example steps. In step **602**, the headset **100** may be powered up for gaming, phone, or music playback purposes where the headset is a powered headset, or may be plugged into a signals source if the headset is a passive headset. In step **604**, a major adjustment is made by configuration of the position of the headband slides **113** in the ear cups **103** to configure the size of the headset to comfortably fit the user.

In step **606**, the headset **100** may be placed on the user's head, followed by step **608** where a minor adjustment of the headset **100** is enabled by the flexibility of the floating headband against the user's head. In addition a tension adjustment may be made using the slides, increasing or decreasing the force on the user's head.

In an example embodiment of the disclosure a headset with major and minor adjustments is disclosed where the headset may comprise a headband, a headband endcap at each end of the headband, a headband slide coupled to each headband endcap, ear cups operatively coupled to the headband slides, and a floating headband coupled to the headband endcaps. A major adjustment of the headset may comprise actuating at least one headband slide in a vertical direction. The ear cups may be operatively coupled to the headband slides utilizing ball detents. The ball detents may hold the position of the ear cups with respect to the headband slides.

The ball detents may comprise a portion of a ball on the headband slide and holes in the ear cup or may comprise a portion of a ball in the ear cup and holes in the headband slide. Each headband slide may be coupled to a headband endcap via a headband pivot. The headband pivot may provide rotational motion of the ear cups with respect to the headband. The floating headband may provide a minor adjustment of the headset. The floating headband may comprise a flexible band with wire segments that extend from the headband endcaps into the floating headband and back down to the headband endcaps. The force on ears of a user of the headset may be configured by the actuating of the at least one headband slide coupled to a headband endcap.

While the present method and/or system has been described with reference to certain implementations, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the scope of the present method and/or system. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the present disclosure without departing from its scope. Therefore, it is intended that the present method and/or system not be limited to the particular implementations disclosed, but that the present method and/or system will include all implementations falling within the scope of the appended claims.

What is claimed is:

1. An audio headset, the headset comprising:
- a headband;
- a headband endcap at each end of the headband;
- a headband slide coupled to each headband endcap;
- ear cups operatively coupled to the headband slides, each ear cup comprising a guide for restricting movement of a cross-bar element of a corresponding headband slide away from the ear cup while allowing vertical movement of the cross-bar with respect to the ear cup; and
- a second headband located only above the headband slides, said second headband comprising a flexible band coupled to the headband endcaps and said second headband not in contact with the headband slides, wherein an adjustment of force on a user of the headset is enabled by actuation of at least one headband slide in a vertical direction, the actuation of the headband slide limited by a corresponding cross-bar element and guide.

2. The audio headset of claim **1**, wherein the ear cups are operatively coupled to the headband slides utilizing ball detents.

3. The audio headset of claim **2**, wherein the ball detents hold the position of the ear cups with respect to the headband slides.

4. The audio headset of claim **2**, wherein the ball detents comprise a portion of a ball on the headband slide and holes in the ear cup.

5. The audio headset of claim **2**, wherein the ball detents comprise a portion of a ball in the ear cup and holes in the headband slide.

6. The audio headset of claim **1**, wherein each headband slide is coupled to a headband endcap via a headband pivot.

7. The audio headset of claim **6**, wherein the headband pivot provides rotational motion of the ear cups with respect to the headband.

8. The audio headset of claim **1**, wherein the second headband provides a second adjustment of the headset.

9. The audio headset of claim **1**, wherein the second headband is coupled to the headband endcaps using wire segments that extend from the headband endcaps into the second headband and back down to the headband endcaps.

10. The audio headset of claim **1**, wherein the force on a user of the headset is increased by extending the at least one headband slide coupled to a headband endcap.

11. A method for adjusting a headset, the method comprising:
- in a headset comprising:
  - a headband;
  - a headband endcap at each end of the headband;
  - a headband slide coupled to each headband endcap;
  - ear cups operatively coupled to the headband slides, each ear cup comprising a guide for restricting movement of a cross-bar element of a corresponding headband slide away from the ear cup while allowing vertical movement of the headband slide and the cross-bar with respect to the ear cup; and
  - a second headband located only above the headband slides, said second headband comprising a flexible band coupled to the headband endcaps and said second headband not in contact with the headband slides;
- enabling adjustment of force on a user of the headset by actuation of at least one headband slide in a vertical direction, the actuation of the headband slide limited by a corresponding cross-bar element and guide.

12. The method of claim **11**, wherein the ear cups are operatively coupled to the headband slides utilizing ball detents.

13. The method of claim 12, wherein the ball detents hold the position of the ear cups with respect to the headband slides.

14. The method of claim 12, wherein the ball detents comprise a portion of a ball on the headband slide and holes in the ear cup.

15. The method of claim 12, wherein the ball detents comprise a portion of a ball in the ear cup and holes in the headband slide.

16. The method of claim 11 wherein each headband slide is coupled to a headband endcap via a headband pivot.

17. The method of claim 16, wherein the headband pivot provides rotational motion of the ear cups with respect to the headband.

18. The method of claim 11, wherein the second headband provides a minor adjustment of the headset.

19. The method of claim 11, wherein the second headband is coupled to the headband endcaps using wire segments that extend from the headband endcaps into the second headband and back down to the headband endcaps.

20. An audio headset, the headset comprising:

a headband;

a headband endcap at each end of the headband;

a headband slide coupled to each headband endcap;

ear cups operatively coupled to the headband slides utilizing ball detents, each ear cup comprising a guide for restricting movement of a cross-bar element of a corresponding headband slide away from the ear cup while allowing vertical movement of the headband slide and the cross-bar with respect to the ear cup; and

a second headband located only above the headband slides, said second headband comprising a flexible band coupled to the headband endcaps and said second headband not in contact with the headband slides, wherein an adjustment of force on a user of the headset is enabled by actuation of at least one headband slide in a vertical direction, the actuation of the headband slide limited by a corresponding cross-bar element and guide.

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